INTERNATIONAL PAPER

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January 29, 2020

Maher Budeir
RCRA Corrective Action Section
U.S. EPA – Region 4
Sam Nunn Atlanta Federal Center
61 Forsyth Street, SW
Atlanta, GA 30303-8960

Subject: Data Gap Investigation Work Plan
International Paper Company
Wood Treating Site, EPA ID # MSD 980 600 084
Wiggins, Mississippi

Dear Mr. Budeir:

International Paper Company submits herein a Data Gap Investigation Work Plan (Work Plan) that includes the elements agreed to in a meeting with EPA, MDEQ, IP and EarthCon representatives during a site visit on December 10, 2019. IP is prepared to begin implementing the Work Plan upon receipt of your approval.

Please do not hesitate to call me at (901) 419-7725 if you need any additional information or have any questions or comments.

Sincerely,

Emily W. Lee

Emily W. Lee, P.G.

Attachments:

cc: Noman Ahsanuzzaman, EPA Region 4
Steve Ginski, IP
Trudy D. Fisher, Butler Snow
Krista Caron, MDEQ
Robert Huckaby, MDEQ
Norman Kennel, EarthCon
Doug Seely, EarthCon

.

DATA GAP INVESTIGATION WORK PLAN

INTERNATIONAL PAPER COMPANY
CLOSED FORMER WOOD TREATING SITE UNITS
WIGGINS, MS 39577
MSD 980 600 084

PREPARED FOR:

INTERNATIONAL PAPER COMPANY
6400 POPLAR AVENUE
MEMPHIS, TN 38197-0001

PREPARED BY:

EARTHCON CONSULTANTS, INC.
1880 WEST OAK PARKWAY
BUILDING 100, SUITE 106
MARIETTA, GA 30062

PROJECT NO. 02.20000006

JANUARY 29, 2020

REGISTERED PROFESSIONAL GEOLOGIST STATEMENT

DATA GAP INVESTIGATION WORK PLAN
INTERNATIONAL PAPER
CLOSED FORMER WOOD TREATING SITE UNITS
WIGGINS, MS
HAZARDOUS WASTE MANAGEMENT FACILITY MSD 980 600 084

I have reviewed this document in sufficient depth to accept full responsibility for its contents related to the geologic discussion/data/information contained herein.

Darrell C. Adkins, RPG #0709
EarthCon Consultants, Inc.

January 29, 2020
Date

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1.0 INTRODUCTION

International Paper Company (IP) is conducting corrective action and groundwater monitoring at the Closed Former Wood Treating Site Units in Wiggins, Mississippi (Wiggins facility) according to the State of Mississippi Hazardous Waste Management Permit HW-980-600-084 that was issued on May 4, 2010 and the HSWA portion of the permit that became effective January 4, 1993.

In a meeting held on December 10, 2019, attended by US Environmental Protection Agency (EPA), Mississippi Department of Environmental Quality (MDEQ), IP and EarthCon Consultants, Inc. (EarthCon) personnel, it was agreed the IP would prepare a Data Gap Investigation Work Plan (Work Plan) for EPA review to include the elements summarized in the following meeting summary:

- *Installation of a "well cluster" in the area between wells WC-40 and WC-44 (actual location to be based upon a review of the potentiometric surface data collected on December 9, 2019)*
  - *One well is to be screened similarly to WC-40 (~135-145' msl).*
  - *The second, deeper well will be screened at the bottom of the Citronelle/top of Pascagoula formations (~115-125' msl).*
  - *The wells will be purged and sampled per methods used for other routine site well sampling.*
- *The following wells will be redeveloped, purged, and sampled:*
  - *WC-43*
  - *WC-08A*
  - *WCP-8*
  - *WP-01*
  - *WP-02*
- *Wells with greater than 10' of well screen (i.e. WC-08A, WCP-8 and WP-02) will utilize a "packer" to isolate the bottom 10' of the screen length during sampling.*

The discussion during the meeting included EPA's concern that elevated concentrations of dissolved wood treating chemical constituents or dense non-aqueous phase liquids (DNAPL) may exist hydraulically downgradient from the closed units at the bottom of the Citronelle/top of the Pascagoula formations. The top of the Pascagoula formation is an aquitard, consisting of clay; therefore, DNAPL, if present may collect in this zone.

EPA, MDEQ, IP and EarthCon representatives also conducted a site visit on December 10, 2019. During the site visit, three shallow wells were observed inside the closed treatment impoundment area (see attached example photograph in Appendix B). The wells were examined during the site visit and were found to be approximately 40 feet deep. IP searched available records regarding well installation/construction, functionality and/or intended use of the wells and was unable to locate any information regarding these three wells.

Included in this Work Plan are a site location map (**Figure 1**), a site map showing features at the Wiggins facility and existing monitoring well locations (**Figure 2**), and potentiometric surface maps for the Citronelle and Pascagoula formation wells based on data collected in December 2019

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(**Figures 3 and 4**). A summary of monitoring well construction data is also attached for reference (**Table 1**). Drilling and well construction logs for WC-08A, WC-40, WC-43, WC-44, WCP-8, WP-1 and WP-2 are included in **Appendix A**.

2.0 MONITORING WELL INSTALLATION AND ABANDONMENT

A monitoring well cluster, consisting of two wells designated WC-56 and WC-57 will be installed in an area between monitoring wells WC-40 and WC-44 as shown on **Figure 5**. The location of the well cluster is hydraulically downgradient of WC-40 based on December 2019 potentiometric surface data (**Figure 3**). The purpose of the two new monitoring wells is to assess potential concentrations of creosote constituents and pentachlorophenol (PCP) in the Citronelle aquifer downgradient from monitoring well WC-40:

- At a similar screen depth as WC-40; and
- At a greater depth; i.e. the at the bottom of the Citronelle/top of Pascagoula formation.

During the same mobilization to install the monitoring well cluster, the three existing monitoring wells identified inside the closed treatment impoundment area will be abandoned.

Monitoring well installation and abandonment will be conducted by a Mississippi-licensed Water Well Contractor and in accordance with applicable guidance included in EPA Region 4 SESDGUID-1-1-R0, Design and Installation of Monitoring Wells (https://www.epa.gov/sites/production/files/2014-03/documents/appendix_m_monitor_well_installation.pdf) and MDEQ Administrative Procedures Act Rules Title 11, Part 7, Surface Water and Groundwater Use and Protection, Licensing of Water Well Contractors and Dam Safety Regulations (https://www.mdeq.ms.gov/wp-content/uploads/2017/10/WellDrillerRegs..pdf).

2.1 Utility Locating

Prior to drilling the boreholes for WC-56 and WC-57, Mississippi 811 will be contacted to identify the locations of public underground utilities in the vicinity of the work. In addition, facility utility information will be requested from Baldwin Pole Mississippi, and a private utility locating service will be contacted to identify potential conflicts with private underground utilities at the proposed boring locations.

2.2 Soil Borings

The boreholes will be drilled using the rotary sonic drilling method. The drilling will involve advancing 10-feet long sections of 4.5-inch outer diameter (OD) and 6.5-inch OD sonic rods. The 4.5-inch OD rod will be advanced 10 feet, then the 6.5-inch OD rod will be advanced over the smaller rod to the same depth. The 4.5-inch rod will then be retrieved to collect the soil sample. This process will be repeated at 10-feet intervals until the desired depth is reached.

The initial borehole, designated WC-56 will be advanced to the contact of the Citronelle and Pascagoula formations (the top of the latter formation is referred to as the Pascagoula clay), this contact has been identified at the Wiggins site as being a yellow to bluish-gray stiff silty clay. The

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second borehole, designated WC-57 will be placed within approximately ten feet from WC-56 and to a depth of approximately 20 feet above the top of the Pascagoula clay. Soil samples will be retrieved from each borehole at 10-feet intervals and the samples will be placed in a polyethylene sleeve. The samples will be observed, classified and logged by the on-site geologist. The larger-diameter sonic rods remain in the borehole and act as an outer casing until the monitoring well is constructed.

2.3 Monitoring Well Installation

After reaching the terminal depth of each borehole, a groundwater monitoring well will be constructed in each borehole as the larger-diameter sonic rods are retrieved. The monitoring wells will be constructed of rigid poly-vinyl chloride (PVC), each with a 10-feet section of screen with 0.010-inch slots. A 20-40 sand filter pack will be installed around the screened section to approximately two feet above the top of the screen, followed by approximately two feet of bentonite pellets. The remainder of the annular space surrounding the riser will be filled with grout after the bentonite is hydrated. Each well will be completed at the surface with a load-rated locking monitoring well vault. After a minimum of 24 hours following well installation and surface completion, each well will be developed to remove residual materials remaining in the wells and to attempt to re-establish the natural hydraulic flow conditions of the formation around the wells. Well development methods used will include pumping with a submersible pump and/or an air-lift pump. The wells will be developed until the column of water in the well is reasonably free of visible sediment.

2.3 Monitoring Well Abandonment

The three monitoring wells observed inside the closed treatment impoundment area will be abandoned in a manner consistent with EPA and MDEQ guidance.

2.4 Surveying

The location and casing elevation for each newly installed well will be surveyed by a Mississippi-registered surveyor, and the information will be added to the site's well network database.

3.0 MONITORING WELL REDEVELOPMENT

Monitoring wells WC-43, WC-08A, WCP-8, WP-1, and WP-2 will be redeveloped prior to sampling. Prior to redevelopment, the depth of each well will be measured and compared to the constructed depth to identify the effort and methods needed for redevelopment. The wells will be redeveloped using a submersible and/or air-lift pump until sediment accumulated in the bottom of each well, if any, has been removed and the recovered water is reasonably free of sediment.

4.0 GROUND WATER SAMPLING

Groundwater samples will be collected during the Spring 2020 semi-annual monitoring event. Prior to sampling, an oil/water interface probe will be used to measure the depth to water, the

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potential presence of separate-phase product, and the total depth of each well. Samples will be collected from:

- The permit required site wells,
- The newly installed monitoring wells (WC-56 and WC-57), and
- Wells WC-43, WC-08A, WCP-8, WP01, and WP-2.

Each well will be purged and sampled using the low-flow method described in the EPA Region 4, Science and Ecosystem Support Division, Operating Procedure SESDPROC-301-R4, Groundwater Sampling (https://www.epa.gov/sites/production/files/2015-06/documents/Groundwater-Sampling.pdf). Field parameter data including pH, specific conductance, temperature, dissolved oxygen, turbidity, and oxidation-reduction potential will be measured during purging and samples will be collected after measurements have stabilized. The data collected during sampling will be recorded Groundwater Sampling Record. A blank Groundwater Sampling Record form is included in **Appendix C**.

A packer will be installed in monitoring wells with screen lengths greater than 10 feet (i.e. WC-08A, WCP-8 and WP-2) prior to purging/sampling activities in an attempt to isolate the bottom of the screened interval during sampling. An inflatable packer will be installed and inflated approximately 10 feet above the bottom of the screened interval. The depth to water in the casing above the packer will be measured during purging and sampling and the purge/sampling rate will be adjusted to minimize drawdown.

4.1 Laboratory Analyses

The samples will be submitted to Pace analytical laboratory in Mt. Juliet, Tennessee for analyses for the Ground Water Protection Standards (GWPS) constituents listed in the MDEQ permit (**Table 2**) using EPA Methods 8260B and 8270C. The laboratory results will be reviewed and validated, and the validated results will be compared to the GWPS.

4.2 Quality Assurance and Quality Control

Quality control (QC) samples will consist of one equipment blank, one duplicate sample, a trip blank for each cooler (VOCs only), and a matrix spike/matrix spike duplicate.

5.0 INVESTIGATIVE-DERIVED WASTE MANAGEMENT

Investigative Derived Waste (IDW) generated during field activities will be addressed in accordance with USEPA Operating Procedure SESDPROC-202-R3 “Management of Investigative Derived Waste” (https://www.epa.gov/sites/production/files/2015-06/documents/Management-of-IDW.pdf). IDW (i.e. drill cuttings, development/purge water, etc.) will be containerized, and the ultimate disposition of the IDW will be determined once analytical results are received utilizing USEPA Operating Procedure SESDPROC-202-R3.

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6.0 REPORT PREPARATION

Upon completion of the fieldwork, receipt of laboratory analyses and data validation, a report will be prepared that will include the following:

- A narrative summary of fieldwork and findings;
- Soil boring logs and well completion diagrams for each newly installed well;
- Well abandonment documentation;
- Groundwater sampling forms;
- Summary tables of field and laboratory data, including water levels and NAPL measurements;
- A site figure showing the locations of monitoring wells, including the newly installed wells; and,
- Laboratory analytical and data validation reports.

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TABLES

Table 1. Monitoring Well Completion Data

Well	Coordinates[8]		Well Installation		Elevation[1]		Screen Top		Screen Bottom		Screen Length
Number	East	North	By	Date	Ground	TOC[2]	Depth	Elevation	Depth	Elevation	(feet)
MONITORING WELLS											
WC-05	51798.58	9782.7	HET[3]	Sep-81	204.71	204.73	15	187.9	25	177.9	10
WC-07[7]	51871	9216	LAW[4]	May-83	239.1	241.2	41	198.1	60.2	178.9	19.2
WC-08	51919.91	9570.82	LAW	May-83	223.52	224.86	28.2	195.5	47	176.7	18.8
WC-11	51894.09	9820.14	LAW	May-83	201.18	202.58	6.2	195	25	176.2	18.8
WC-13	50577.54	9593.83	LAW	Apr-83	239.39	241.17	41	198.5	60.2	179.3	19.2
WC-14	51690.28	9316.19	LAW	Aug-83	236.04	238.04	40.9	195.2	60.3	175.8	19.4
WC-19	50715.63	9290.66	JLGA[5]	Jul-84	244.51	247.27	55	189.5	65	179.5	10
WC-21[7]	51734	9044	JLGA	Jun-87	240.8	243.3	49.2	191.7	69.3	171.6	20.1
WC-22	51236.24	9373.88	JLGA	Dec-85	243.13	244.68	48.9	194.4	63.9	179.4	15
WC-23	51247.08	9181.39	JLGA	Dec-85	246.33	248.1	48.7	197.7	63.7	182.7	15
WC-24	51349.14	9025.66	JLGA	Dec-85	247.08	249.64	50	197	65	182	15
WC-25	51584.65	9031.57	JLGA	Dec-85	242.85	245.75	49.7	193.1	64.7	178.1	15
WC-28	51884.38	9018.1	JLGA	Jun-87	236.23	238.22	50.9	185.6	70.9	165.6	20
WC-29	51811.17	9105.67	JLGA	Jun-87	240.95	241.59	46.3	192.7	66.3	172.7	20
WC-30	51759.47	9172.77	JLGA	Jun-87	242.02	243.27	42.8	198.1	62.8	178.1	20
WC-31	51445.5	9403.94	JLGA	Jun-87	236.08	237.7	35.7	200.7	55.8	180.6	20.1
WC-33	50712.96	9342.4	JLGA	Jun-87	244.6	247.03	41.1	203.4	61.1	183.4	20
WC-34	50599	9349.59	JLGA	Jun-87	242.7	243.83	49.6	191.7	69.6	171.7	20
WC-35	50542.87	9435.24	JLGA	Jun-87	241.44	242.69	50.2	189	70.2	169	20
WC-36	9924	50746	JLGA	Jun-87	232.5	234.38	40	194.38	60	174.38	20
WC-39	51803.03	8720.38	WCC[6]	Sep-91	239.94	242.1	95	144.52	105	134.52	10
WC-40	51277.55	8698.61	WCC	Sep-91	248.42	250.71	95	153.42	105	143.42	10
WC-41	51593.77	8100.28	WCC	Feb-93	248.92	251.43	122.5	126.56	132.5	116.56	10
WC-42	51939.85	7489.57	WCC	Feb-93	249.04	252.21	117	132.36	127	122.36	10
WC-43	51595.42	9320.68	WCC	Feb-93	235.81	238.33	106	129.23	116	119.23	10
WC-44	50976.95	8081.22	Premier	Jun-05	240.18	240.03	44	196.13	64	176.3	20
WC-45	51262.94	8722.78	Premier	Oct-06	248.48	248.15	98	150.48	108	141.48	10
WC-46	51285.86	8679.64	Premier	Oct-06	248.30	247.93	65	183.3	75	173.3	10
WC-47	51289.65	8669.40	Premier	Oct-06	248.21	247.77	95	153.21	105	143.21	10
WC-48	51906.05	8265.80	Premier	Oct-06	241.32	240.79	55	186.32	65	176.32	10
PILOT STIDY WELLS											
WC-48i	486188.63	892433.67	EarthCon	Oct-11	214.84	217.84	15	202.84	50	187.84	15
WC-49s	486190.91	892428.82	EarthCon	Oct-11	214.41	217.71	15	202.71	30	187.71	15

EarthCon Project No. 02.20000006.18

Table 1. Monitoring Well Completion Data

Well	Coordinates[8]		Well Installation		Elevation[1]		Screen Top		Screen Bottom		Screen Length
Number	East	North	By	Date	Ground	TOC[2]	Depth	Elevation	Depth	Elevation	(feet)
WC-49i	486188.63	892433.67	EarthCon	Oct-11	214.84	217.84	35	182.84	50	167.84	15
WC-50i	486156.64	892458.70	EarthCon	Oct-11	218.4	221.41	10	211.41	50	171.41	10
WC-50s	486161.68	892454.71	EarthCon	Oct-11	217.6	221.10	20	201.1	35	186.1	15
WC-51i	486128.34	892490.22	EarthCon	Oct-11	220.79	223.64	45	178.64	55	168.64	10
WC-51s	486132.99	892485.81	EarthCon	Oct-11	219.17	222.97	25	197.97	40	182.97	15
WC-52i	486063.92	892338.52	EarthCon	Oct-11	221.41	224.76	55	169.76	65	159.76	10
WC-52s	486066.83	892332.92	EarthCon	Oct-11	221.43	224.93	30	194.93	40	184.93	10
WC-53i	4865051.28	892406.53	EarthCon	Oct-11	225.21	228.21	55	173.21	65	163.21	10
WC-53s	486057.38	892403.78	EarthCon	Oct-11	224.81	228.01	35	193.01	50	178.01	15
WC-54s	485908.37	892197.81	EarthCon	Oct-11	228.92	232.52	35	197.52	50	182.52	15
WC-55i	485902.31	892361.63	EarthCon	Oct-11	230.8	234.23	55	179.23	65	169.23	10
WC-55s	485908.45	892354.82	EarthCon	Oct-11	230.84	234.09	35	199.09	50	180.84	15
RECOVERY WELLS											
WCP-1	51852.92	9753.23	JLGA	Nov-88	205.47	208.35	15.5	189.7	40.5	164.7	25
WCP-2	51721.74	9566.54	JLGA	Nov-88	223.14	225.67	32.8	190	57.9	165	25.1
WCP-3	51602.79	9410.99	JLGA	Nov-88	229.59	231.85	45.7	183.3	70.7	158.3	25
WCP-4	51388.16	9340.05	JLGA	Nov-88	239.43	242.26	50	189.1	75	164.1	25
WCP-5	51786.76	9403.72	JLGA	Nov-88	230.57	233.36	35	195.3	60	170.3	25
WCP-6	51551.46	9267.35	JLGA	Nov-88	238.25	241.38	45.6	193.1	70.6	168.1	25
WCP-7	51748.16	9105.31	JLGA	Nov-88	240.65	244.21	52	188.7	77	163.7	25
WCP-8	51485.87	9091.15	JLGA	Nov-88	244.09	247.24	56.5	187.5	81.5	162.5	25
WCP-9	50669.18	9325.18	JLGA	Nov-88	243.32	245.62	57	186.4	82	161.4	25
PASCAGOULA WELLS											
WP-1	N/A	N/A	LAW	May-83	205.79	207.52	135	N/A	144.4	N/A	9.4
WP-2	N/A	N/A	JLGA	Aug-84	238.6	239.39	169	N/A	189	N/A	20
WP-3	N/A	N/A	JLGA	Aug-84	239.54	242.59	159	N/A	169	N/A	10
WP-4P	N/A	N/A	JLGA	Dec-85	205.4	207.55	167	N/A	217	N/A	50
RECHARGE WELLS											
WCR-1[7]	51561	9844	JLGA	Nov-88	219.9	222.89	30	189.9	45	174.9	15
WCR-2[7]	51475	9795	JLGA	Nov-88	221.2	224.19	30	191.2	45	176.2	15
WCR-3[7]	51386	9751	JLGA	Nov-88	224.2	226.36	35	189.2	50	174.2	15
WCR-4[7]	51292	9705	JLGA	Nov-88	227.3	230.22	35	192.3	50	177.3	15
WCR-5[7]	51603	9864	JLGA	Apr-89	218.2	221.02	18.5	199.7	110.5	107.7	92
WCR-6[7]	51518	9821	JLGA	Apr-89	220.8	223.16	20	200.8	110.5	110.3	90
WCR-7[7]	51443	9785	JLGA	Apr-89	222.8	225.16	16.5	206.3	108	114.8	91.5

Table 1. Monitoring Well Completion Data

Well	Coordinates[8]		Well Installation		Elevation[1]		Screen Top		Screen Bottom		Screen Length
Number	East	North	By	Date	Ground	TOC[2]	Depth	Elevation	Depth	Elevation	(feet)
WCR-8[7]	51327	9719	JLGA	Apr-89	226	228.83	25	201	105	121	80

Notes:

[1] All depths and elevations are in feet, screen depth is measured below ground surface.

[2] **TOC** = Top of Casing

[3] **HET** = Harmon Engineering and Testing Company

[4] **LAW** = Law Engineering Testing Company

[5] **JLGA** = James L. Grant and Associates

[6] **WCC** = Woodward-Clyde Consultants

[7] Well was abandoned in June 2005.

[8] Wells were resurveyed in 2006.

N/A Information not available.

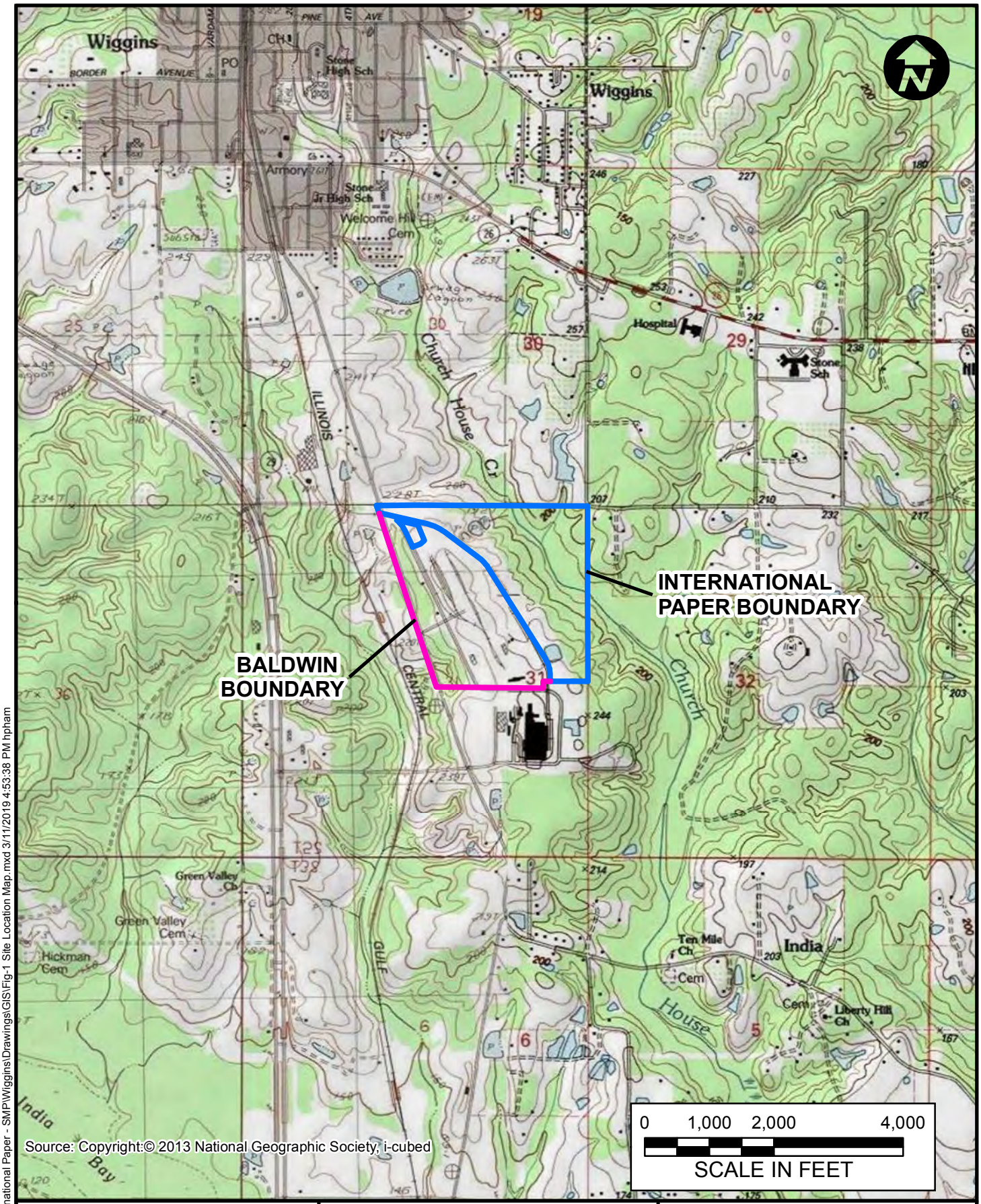
Prepared by: TJM 2/25/19
Reviewed by: JRM 2/28/19

EarthCon Project No. 02.20000006.18

Table 2. Monitoring Parameters and GWPS

Constituent	GWPS (ug/L)
2,3,4,6-Tetrachlorophenol	1100
2,4,6-Trichlorophenol	3.6
2,4-Dichlorophenol	110
2,4-Dimethylphenol	730
2-Methylnaphthalene	122
2-Methylphenol (o Cresol)	1800
3 and 4-Methylphenol (m and p Cresol)*	180**
Acenaphthene	370
Acenaphthylene	2190
Anthracene	1800
Benzo(b)fluoranthene	0.092
Benzo(k)fluoranthene	0.92
Carbazole	3.4
Chrysene	9.2
Dibenzofuran	12
Fluoranthene	1500
Fluorene*	240
Naphthalene*	6.2
Pentachlorophenol*	1.0
Phenanthrene*	1100
Phenol	11000
Pyrene	180
Ethylbenzene	700
Xylene	10000

FIGURES



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WIGGINS, MISSISSIPPI

PROJECT NO. 02.20000006

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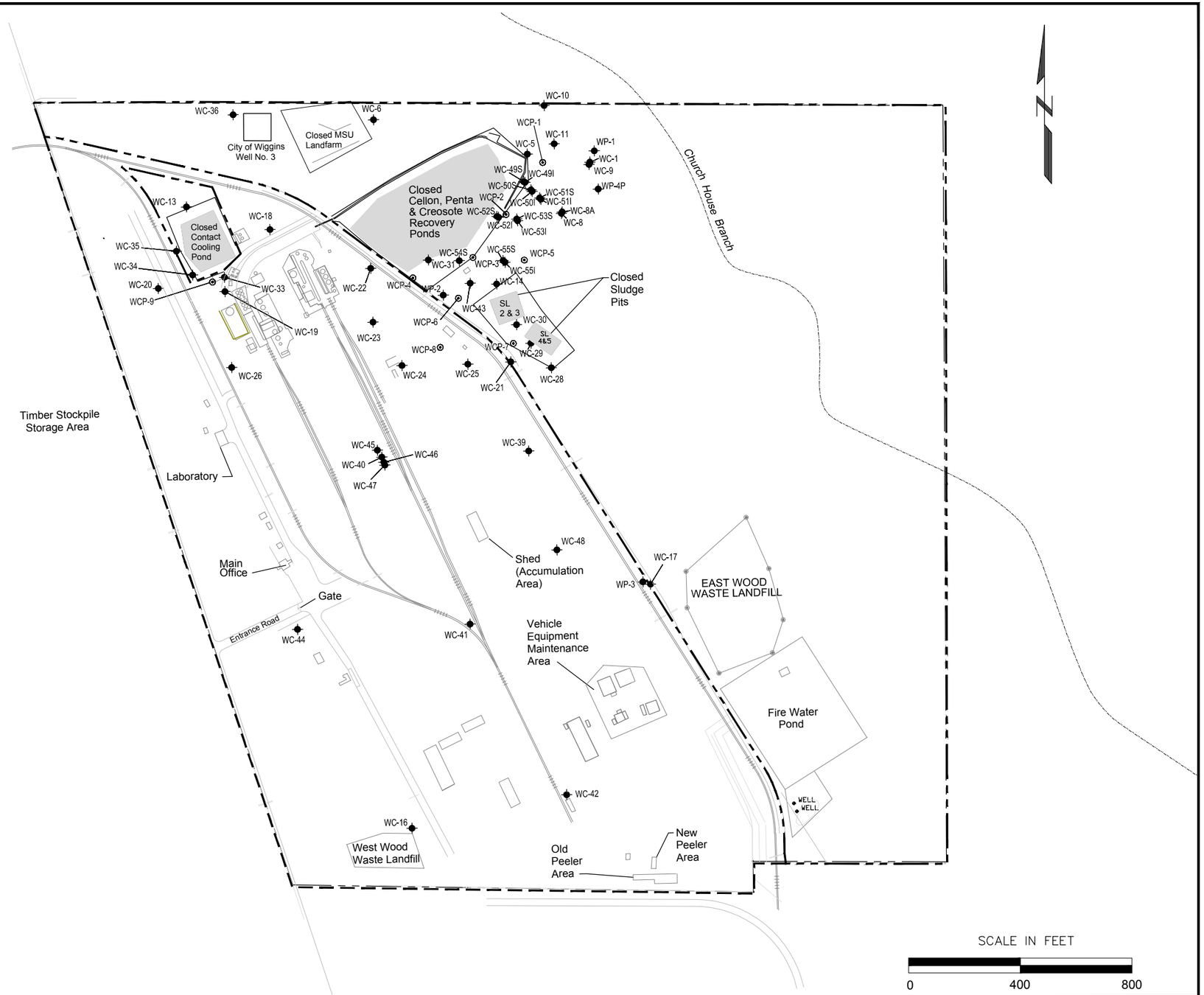
SITE LOCATION MAP

DRAWN	CHECKED	DATE	FIGURE
HVP	DA	MAR 2019	1

File: S:\Premier\Projects\International Paper - SMP\Wiggins\Drawings\GIS\Fig-1 Site Location Map.mxd 3/11/2019 4:53:38 PM hpham



LEGEND

- Groundwater Monitoring Well
- Groundwater Extraction Well
- International Paper Boundary
- Baldwin Pole Boundary
- Railroad tracks
- Fenceline

INTERNATIONAL PAPER

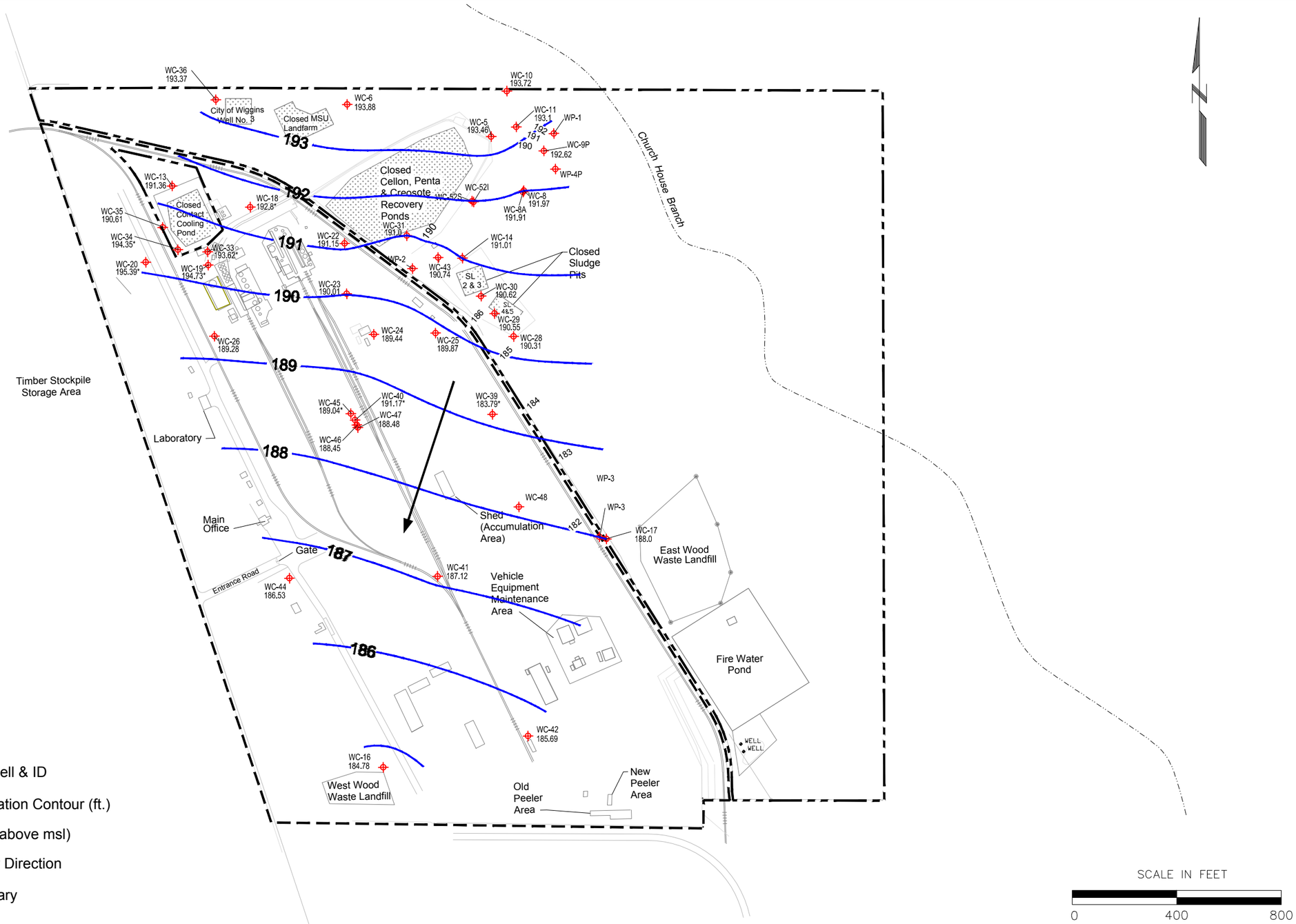
FORMER TREATED WOOD PRODUCT FACILITY
WIGGINS, MISSISSIPPI

PROJECT NO. 02.20000006

EarthCon Consultants, Inc.
1880 WEST OAK PKWY, BLDG 100, STE 106, MARIETTA, GA, 30062

WIGGINS FACILITY SITE MAP

DRAWN:	CHECKED:	DATE:	FIGURE:
HVP	MAB	FEB 2019	2



LEGEND

- WC-16 — Groundwater Monitoring Well & ID
- 186 — Inferred Groundwater Elevation Contour (ft.)
- 184.78 — Groundwater Elevation (ft. above msl)
- Inferred Groundwater Flow Direction
- International Paper Boundary
- Baldwin Pole Boundary
- Railroad tracks
- * — Data not used in contouring
- NM — Not Measured

INTERNATIONAL PAPER

FORMER TREATED WOOD PRODUCTS FACILITY
WIGGINS, MISSISSIPPI

PROJECT NO. 02.20000006.90

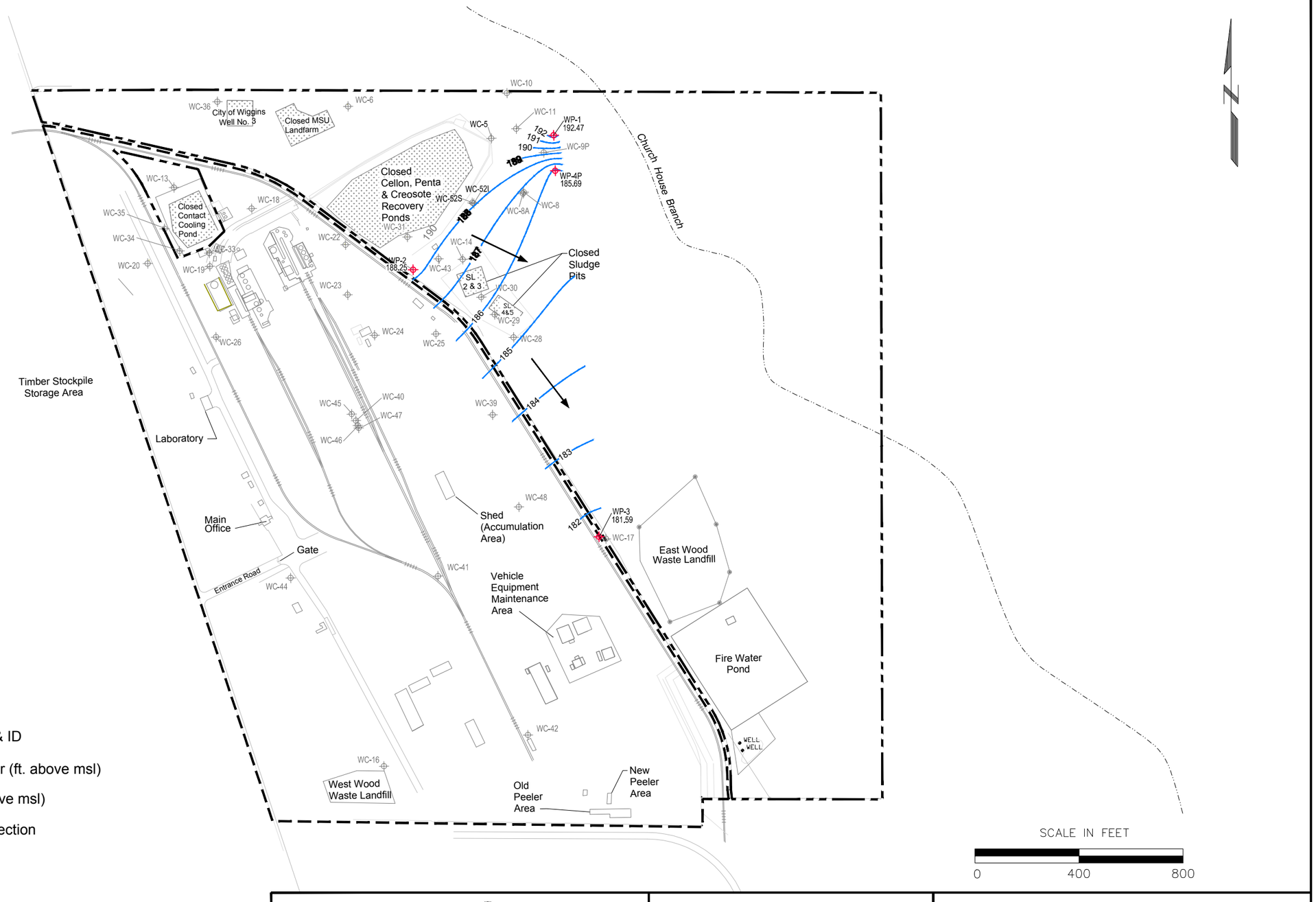
EARTHCON®

EarthCon Consultants, Inc.
1880 WEST OAK PKWY, BLDG 100, STE 106, MARIETTA, GA, 30062

CITRONELLE AQUIFER POTENTIOMETRIC SURFACE MAP DECEMBER 9, 2019

DRAWN:	CHECKED:	DATE:	FIGURE:
HVP	DCA	DEC 13, 2019	3

FILENAME: Nov 2016 S:\Premier\Projects\International Paper - SMP\Wiggins\Drawings\Monitoring Reports\2019\Dec 2019 POT.dwg (POTMAP) 01/21/20 19:11 - hpham



LEGEND

- WP-4P — Groundwater Monitoring Well & ID
- 184 — Groundwater Elevation Contour (ft. above msl)
- 185.69 — Groundwater Elevation (ft. above msl)
- Inferred Groundwater Flow Direction
- International Paper Boundary
- Baldwin Pole Boundary
- Railroad tracks

INTERNATIONAL PAPER

FORMER TREATED WOOD PRODUCTS FACILITY
WIGGINS, MISSISSIPPI

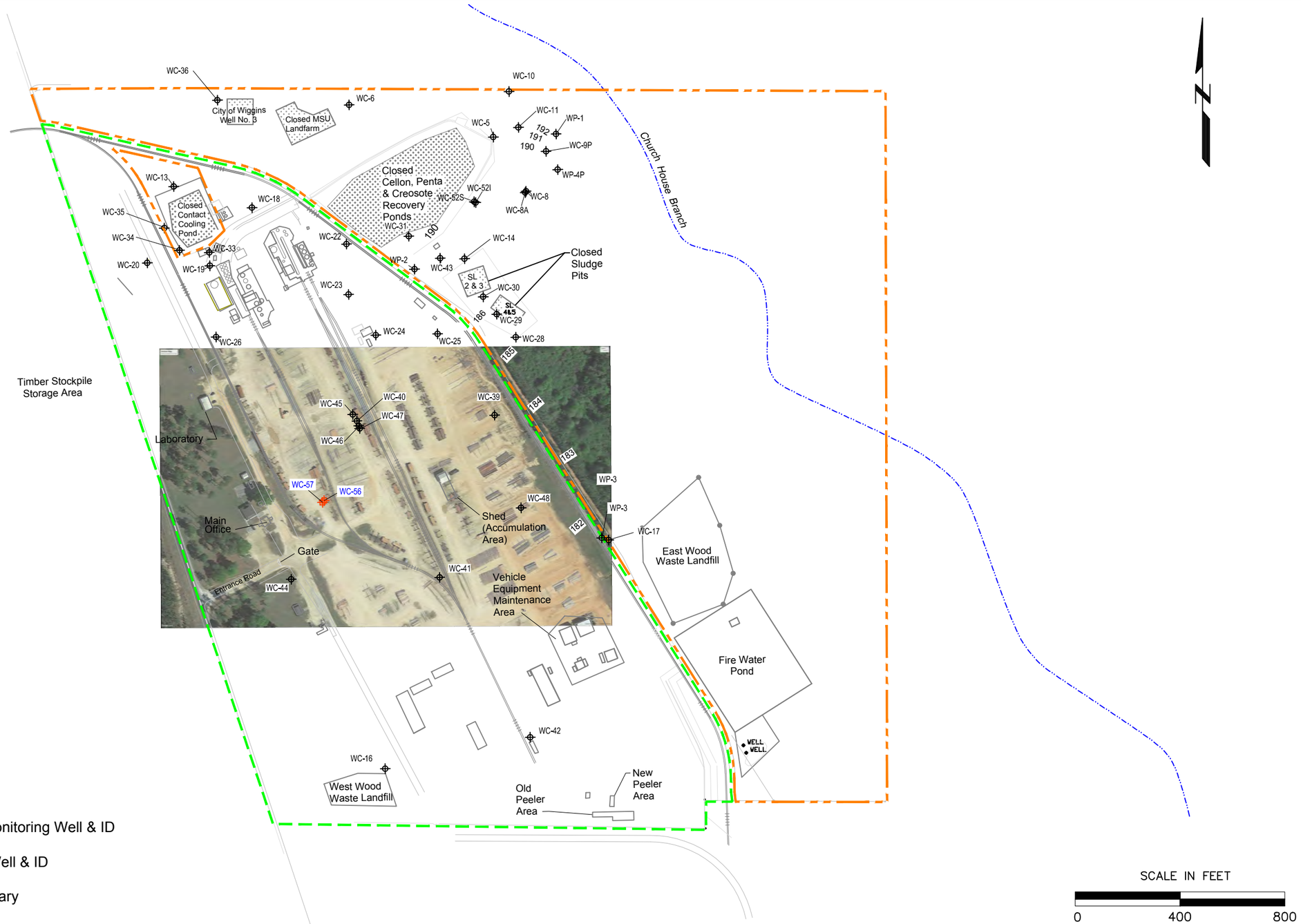
PROJECT NO. 02.20000006.90

EarthCon Consultants, Inc.
1880 WEST OAK PKWY, BLDG 100, STE 106, MARIETTA, GA, 30062

PASCAGOULA AQUIFER POTENTIOMETRIC SURFACE MAP DECEMBER 9, 2019

DRAWN:	CHECKED:	DATE:	FIGURE:
HVP	DCA	DEC 16, 2019	4

FILENAME: Nov 2016 S:\Premier\Projects\International Paper - SMP\Wiggins\Drawings\Monitoring Reports\2019\Dec 2019 POT PASCAGOULA.dwg (PASCAGOULAAQUIFER) 01/09/20 20:57 - hpham



LEGEND

- WC-56 — Proposed Groundwater Monitoring Well & ID
- WC-16 — Groundwater Monitoring Well & ID
- International Paper Boundary
- Baldwin Pole Boundary
- Railroad tracks

(Aerial Source: Google Earth Imagery 03/2019)

INTERNATIONAL PAPER

FORMER TREATED WOOD PRODUCTS FACILITY
WIGGINS, MISSISSIPPI

PROJECT NO. 02.20000006.90

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PROPOSED MONITORING WELL LOCATIONS MAP

DRAWN:	CHECKED:	DATE:	FIGURE:
HVP	DCA	JAN 21, 2020	5

FILENAME: Nov 2016 S:\Premier\Projects\International Paper – SMP\Wiggins\Drawings\Monitoring Reports\2019\Proposed Monitoring Well Locations.dwg (PRP WELLS) 01/29/20 16:14 – hpham

APPENDICES

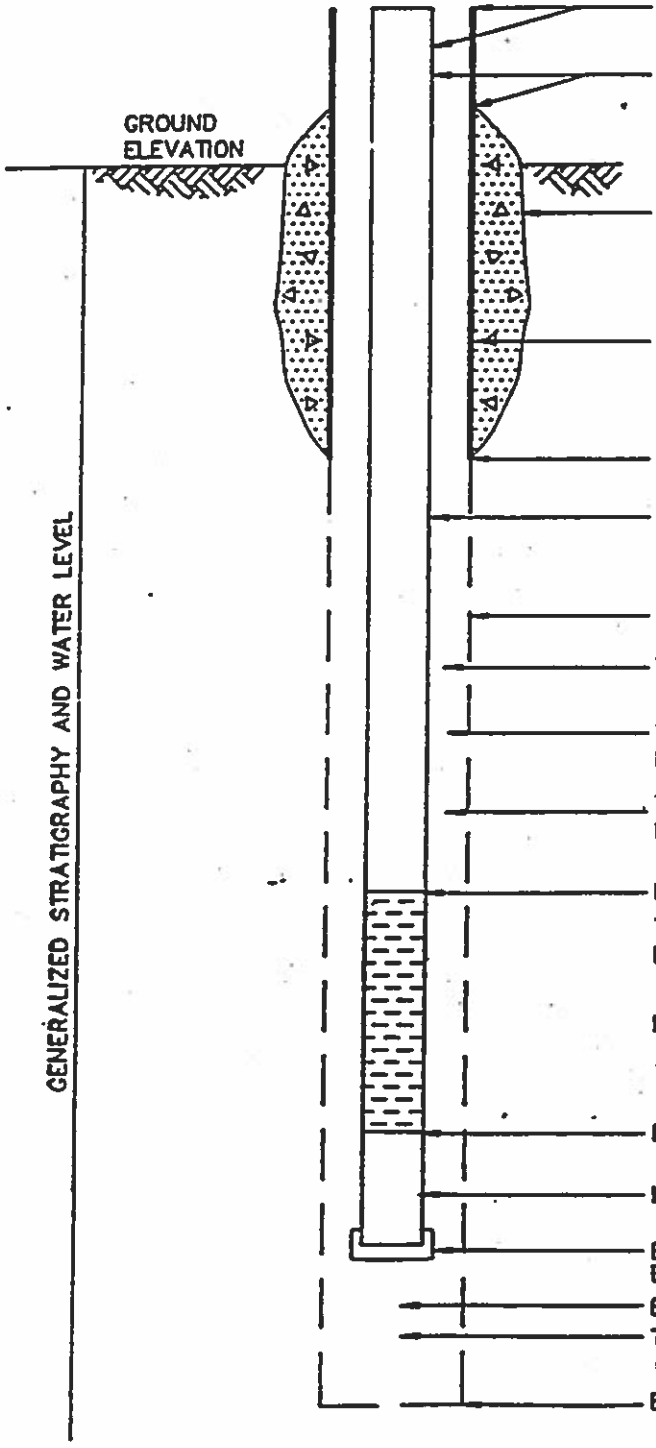
APPENDIX A
SOIL BORING AND WELL CONSTRUCTION LOGS FOR SELECT WELLS

Woodward-Clyde Consultants

MONITOR WELL INSTALLATION REPORT

PROJECT International Paper 91B618C
LOCATION Wiggins, Mississippi
DATE COMPLETED 09/12/91 ORIGINAL DEPTH 110
INSPECTED BY Steve Krul DATE 09/12/91
CHECKED BY DATE

PAGE 1 OF 1
WELL NO. WC-40
AQUIFER Citronelle
zone
DEPTH INTERVAL



ELEVATION OF TOP OF SURFACE CASING/ RISER PIPE	2.2
HEIGHT OF TOP OF SURFACE CASING/RISER PIPE ABOVE GROUND SURFACE	2.0
DEPTH OF SURFACE SEAL BELOW GROUND SURFACE	2"
TYPE OF SURFACE SEAL: cement	
I.D. OF SURFACE CASING	4"
TYPE OF SURFACE CASING Steel with a locking cap	
DEPTH OF SURFACE CASING BELOW GROUND	4.0'
I.D. OF RISER PIPE	2"
TYPE OF RISER PIPE: PVC	
DIAMETER OF BOREHOLE	5 7/8
DEPTH OF BOREHOLE	110
TYPE OF BACKFILL: Grout - Portland Cement and Bentonite	
ELEV./DEPTH TOP TO SEAL	72'
TYPE OF SEAL: Bentonite Pellets	
ELE./DEPTH BOTTOM OF SEAL	81'
TYPE OF SAND PACK 20/40 Silica Sand	
DEPTH OF TOP OF SAND PACK	81'
ELEV./DEPTH TOP OF SCREENED SECTION	95'
TYPE OF SCREENED SECTION: PVC	
DESCRIBE OPENINGS 0.01	
I.D. OF SCREENED SECTION	2"
ELEV./DEPTH BOTTOM OF SCREENED SECTION	105'
LENGTH OF BLANK SECTION	2.5'
ELEV./DEPTH BOTTOM OF PLUGGED BLANK SECTION	
ELEV./DEPTH BOTTOM OF SAND COLUMN	
TYPE OF BACKFILL BELOW OBSERVATION PIPE sand	
ELEV./DEPTH OF HOLE	110

LOG OF BORING

PROJECT: **Modification to Corrective Action Program**
LOCATION: **International Paper Company, Wiggins, Mississippi**
CLIENT: **International Paper Company, Wiggins, Mississippi**

BORING: WC-43
FILE: 91B618C
DATE: 2/24/93
TECHNICIAN: SAK
APPROVED: mec
PAGE: 1 of 3

Wash Bored: **Full Depth**

DEPTH (FEET)	SAMPLE	S.P.T.(b/ft) or P.Pen.(tsf)	OVA (ppm)	Recovery (inch)	Description of Stratum
0					Dense dark red Silty SANDS, dry (SM)
5				12	
10				24	—with white sand streaks at 10'
15				18	
20				15	Firm light reddish pink and yellow Silty SANDS, dry (SM)
25				19	Alternating layers of stiff dark reddish purple laminated CLAYS and reddish pink and tan SANDS (CH/SP)
30				20	Loose red, white and tan SANDS, moist (SP)
35				16	—with red, purple and yellow clay pockets at 35'
40				14	
45				16	—wet to saturated at 45'
50				20	

Continued Next Page

Unified Soil Classifications based on visual observations.

Woodward-Clyde Consultants

LOG OF BORING

PROJECT: Modification to Corrective Action Program
LOCATION: International Paper Company, Wiggins, Mississippi
CLIENT: International Paper Company, Wiggins, Mississippi

BORING: WC-43
FILE: 91B618C
DATE: 2/24/93
TECHNICIAN: SAK
APPROVED: MEC
PAGE: 2 of 3

DEPTH (FEET)	SAMPLE	S.P.T.(b/ft) or P.Pen.(tsf)	OVA (ppm)	Recovery (inch)				Description of Stratum
50								Loose red and white medium to fine grained SANDS (SP)
				16				
55								—tan at 55'
				22				
60								Alternating layers of purple CLAYS with yellow and red streaks and tan and dark red SANDS (CH/SP)
				17				
65								Firm brown SANDS, moist, with saturated tan sand and gravel (SP)
				15				
70								Firm to loose tan Silty SANDS, saturated (SM)
				24				
75								
				22				
80								
				19				
85								—with dark red and purple clay pockets at 85'
				9				
90								Loose tan, pink and white SANDS, saturated (SP)
		NR						
95								
				7				
100								

Continued Next Page

NR = No Recovery

Unified Soil Classifications based on visual observations.

LOG OF BORING

PROJECT: **Modification to Corrective Action Program**

LOCATION: **International Paper Company**
Wiggins, Mississippi

CLIENT: **International Paper Company**
Wiggins, Mississippi

BORING: WC-43
FILE: 91B618C
DATE: 2/24/93
TECHNICIAN: SAK
APPROVED: MSC
PAGE: 3 of 3

DEPTH (FEET)	SAMPLE	S.P.T.(b/ft) or P.Pen.(tsf)	OVA (ppm)	Recovery (inch)	Description of Stratum
100					Dense to firm tan SANDS, saturated (SP)
		NR			
105				4	
110				5	—dense to very dense pink, red and tan at 110'
115				24	Stiff tan, yellow and light gray CLAYS (CH)
120					Bottom of boring at 120'. Well WC-43 was set in borehole.

NR = No Recovery

Unified Soil Classifications based on visual observations.

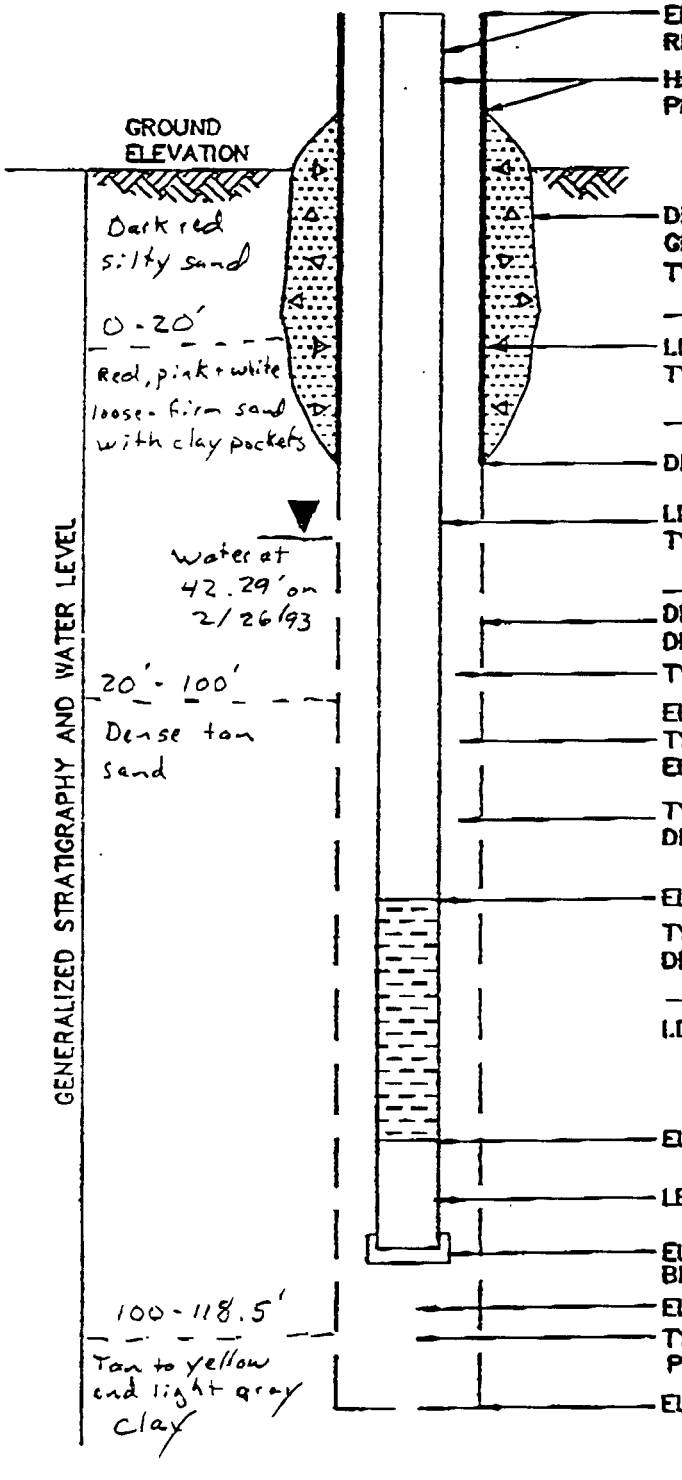
Woodward-Clyde Consultants

Woodward-Clyde Consultants

MONITOR WELL INSTALLATION REPORT

PROJECT International Paper Company 9136180
LOCATION Wiggins, Mississippi
DATE COMPLETED 2/25/93 ORIGINAL DEPTH 120
INSPECTED BY Steve Krul DATE 2/25/93
CHECKED BY _____ DATE _____

PAGE 1 OF 1
WELL NO. WC-43
AQUIFER Citronelle zone
DEPTH INTERVAL _____



ELEVATION OF TOP OF SURFACE CASING/ RISER PIPE	
HEIGHT OF TOP OF SURFACE CASING/RISER PIPE ABOVE GROUND SURFACE	2.6'
DEPTH OF SURFACE SEAL BELOW GROUND SURFACE	2"
TYPE OF SURFACE SEAL: Cement	
I.D. OF SURFACE CASING	6"
TYPE OF SURFACE CASING Steel with locking cap	
DEPTH OF SURFACE CASING BELOW GROUND	3.0
I.D. OF RISER PIPE	2"
TYPE OF RISER PIPE: PVC	
DIAMETER OF BOREHOLE	6"
DEPTH OF BOREHOLE	
TYPE OF BACKFILL: Grout-Portland Cement + Bentonite	
ELEV./DEPTH TOP TO SEAL	96'
TYPE OF SEAL: Bentonite Pellets	
ELE./DEPTH BOTTOM OF SEAL	101
TYPE OF SAND PACK 20-40 silica sand	
DEPTH OF TOP OF SAND PACK	101
ELEV./DEPTH TOP OF SCREENED SECTION	106
TYPE OF SCREENED SECTION: PVC	
DESCRIBE OPENINGS 0.01	
I.D. OF SCREENED SECTION	2"
ELEV./DEPTH BOTTOM OF SCREENED SECTION	116
LENGTH OF BLANK SECTION	2.5
ELEV./DEPTH BOTTOM OF PLUGGED BLANK SECTION	118.5'
ELEV./DEPTH BOTTOM OF SAND COLUMN	118.5'
TYPE OF BACKFILL BELOW OBSERVATION PIPE Sand + gravel	
ELEV./DEPTH OF HOLE	118.5

County: Stone

Permit #:

Driller: 0578

Date drilling completed: 6-6-05

State Well Report

Part 1 – Driller's Log

Mississippi Department of Environmental Quality
Office of Land and Water Resources
P.O. Box 10631
Jackson, MS 39289-0631
(601)961-5210
(601)354-6938 (fax)

For Office Use Only:

Aquifer:

Well #:

L. S. Elevation:

E-log #:

State Law requires that this report be prepared by the license holder responsible for the work and filed with the Department at the above address within 30 days of completion of drilling of the well or borehole.

Information on Well Owner
(Landowner if borehole is not for a water well)

Owner Name International Paper

Mailing Address:

City State Zip Code

Telephone No. (____)

Well or Borehole Location

Latitude: 30 ° 50 ' 09 " Longitude: 89 ° 07 ' 36 "

Method of Lat/Long (circle one): Conventional Survey, USGS quad, Hand-held GPS, Survey-grade GPS

NE ¼ NW ¼ Sec 31 Twn 2S Rng 11W

Distance 1 Miles Direction S of Nearest Town Wiggins

Well / Borehole Data

Date drilling started: 6-6-05 Date drilling completed: 6-6-05 Hole depth: 64 Hole diameter: 8.5"

Location of the source of any surface water used for drilling: HSA Drilling Technique
Method of dosing and volume of Chlorine used in drilling and development: NA

Logs run (circle all applicable): No log run Electric Gamma Ray Density Sonic Neutron Other: NA
Name of organization running log(s): NA

Purpose of borehole (check one): Water Well___ Geotechnical/Geological Investigation___ Ground Source Heat Pump___

Seismic Survey___ Other (*describe*) monitor well

If drilling is not related to water well construction, skip the remainder of this block

Purpose of Well (check one): Home ___ Industrial___ Public Supply___ Irrigation___ Fish Culture ___ Other: monitor

If a flowing well, method of flow regulation: Valve _____ Other (describe) _____

Static Water Level: _____ feet above or below (circle one) land surface Date measured: _____

Method of Measurement (circle one) steel tape electric tape air line other: _____

Well depth: 64 Well grouted to a depth of 40 feet Type of grout (circle one): Neat Cement Bentonite Mix

Casing length: 44 feet Casing diameter: 2 inches Type of casing: PVC

Screen length: 20 feet Screen diameter: 2 inches Type of screen: PVC

Screen slot size: .010 inches Setting depth: From 44 feet to 64 feet

Type of completion (circle all applicable): Gravel packed Underreamed Telescoped Open hole Natural Development

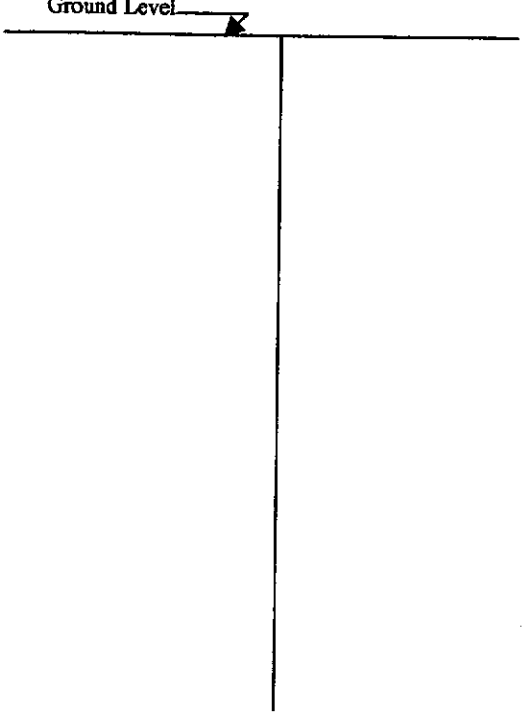
Other (describe): 8" Flush mount

Top of lap pipe or reduction in casing: _____ feet. *If telescoped or more than one screen, describe on next page*

The sketch below only required for water wells

If well telescopes, show depths on sketch.

Ground Level



If more than one screen, show location of each on sketch

Description of formations encountered must be provided for all wells and boreholes, unless specifically exempted by regulations

Description of Formations Encountered	From (depth) Ground Level	To (depth)
Silty Clay	0	20
Silty Sand	20	38
Red Silty Sand	38	64

Sketch the property layout and include the following: 1) the well location; 2) any permanent structures on the property that may aid in locating the well; 3) any roads, power lines, or other items that may aid in locating the property and the well; 4) a north arrow.

See Attached Copy

Landowner Name: _____

Form: OLWR-SWR-1A

I certify that the well/borehole was drilled, constructed, and completed in accordance with all applicable requirements of the Mississippi Department of Environmental Quality and the Mississippi Department of Health regulations, if applicable, and state laws.

Gary P. Hill — 1-6-06 — Gary P Hill

Print Name of Responsible Licensee and License No. **Date** **Signature of Licensee**

WC-44

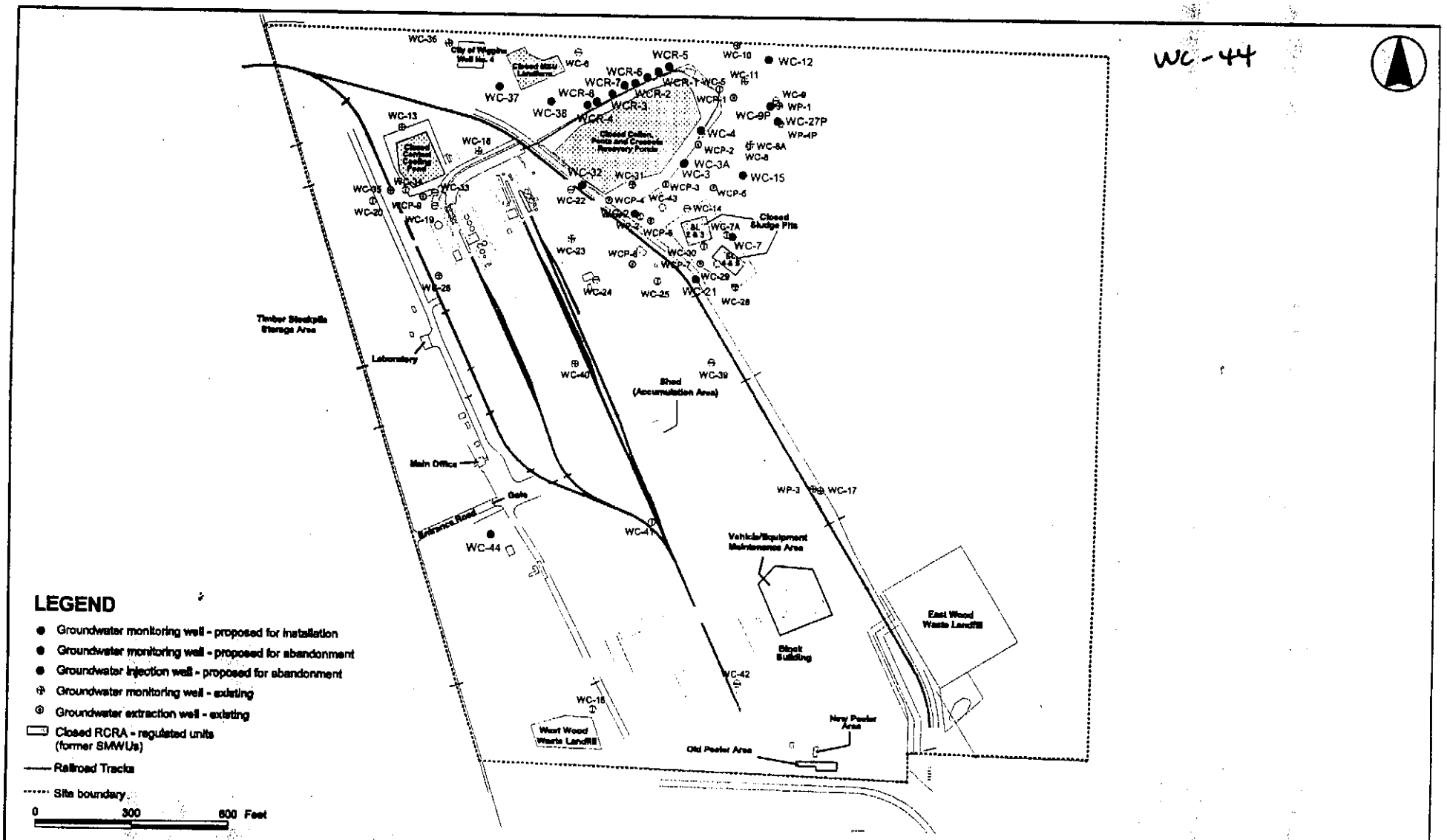


Figure 2. Wiggins facility site map

PREMIER INTERNATIONAL PAPER

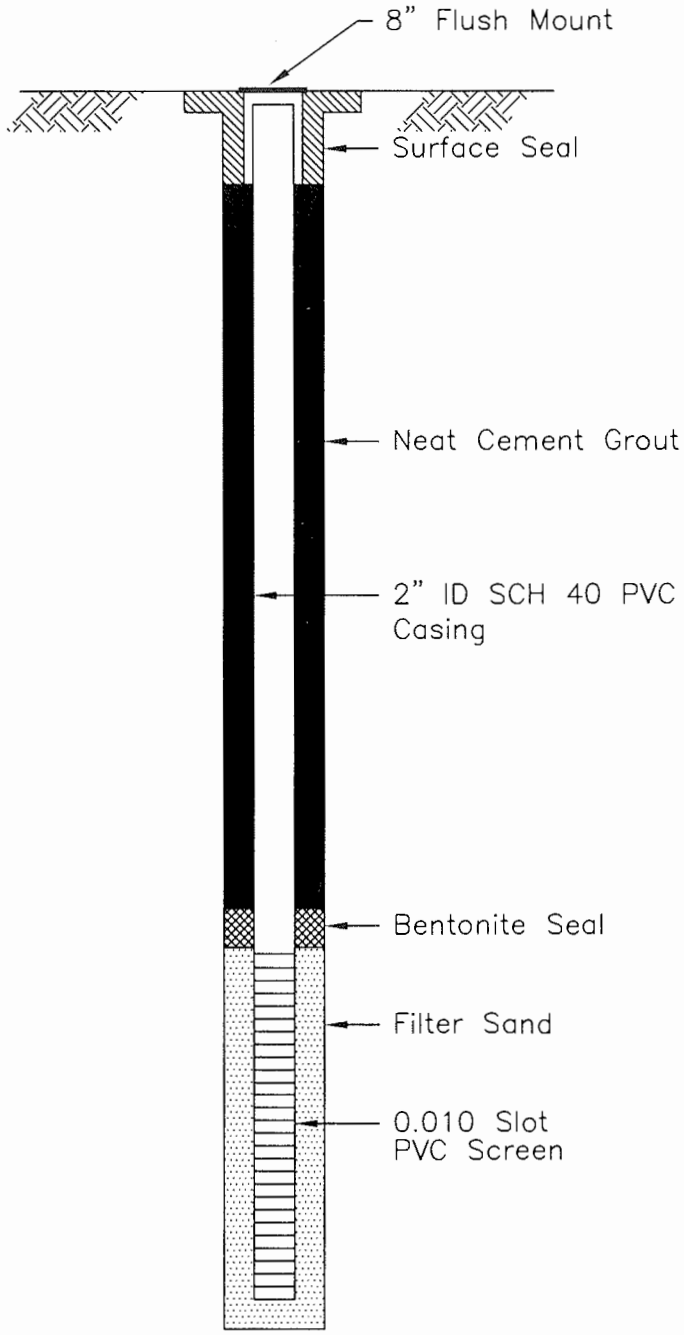
MONITORING WELL WC-44

Well ID: WC-44
Driller: WALKER-HILL
Logged By: PREMO

Date: 6-6-05

Hole Dia.: 8.5"
Drill Method: HSA

DESCRIPTION	DEPTH (ft)	WELL CONSTRUCTION DETAIL
SILTY CLAY	0, 5, 10, 15, 20	8" Flush Mount; Surface Seal; Neat Cement Grout
SILTY SAND	20, 25, 30, 35, 40	2" ID SCH 40 PVC Casing; Bentonite Seal
RED SILTY SAND	40, 45, 50, 55, 60	Filter Sand; 0.010 Slot PVC Screen
BOREHOLE TERMINATED AT 64'	65	



INTERNATIONAL PAPER
Treated Wood Product Facility
Wiggins, MS

PREMO INC
1880 WEST OAK PKWY, BLDG 100, SUITE 106
MARIETTA, GEORGIA 30062

MONITORING WELL CONSTRUCTION DETAIL

DATE: APRIL 2006

FIGURE 1

BORING RECORD

Surface Elev. (Feet)	Depth (Feet)	Description	Unified Soil Classif.	Penetration Resistance, "N" Blows per Foot (10 20 30 40 50 60 70 80 90)	Sample Data	Remarks
223.24		Soil sampling started at 54.5'. (See Boring WC-8 for 0 to 54.5')				
	54.5					
	55.0	CITRONELLE FORMATION: Firm to dense, white and tan silty fine to medium sand with thin purple silty clay layers	SM		X	NO
	60.0				X	NO
	65.0				X	NO
	70.0				X	NO
	75.0				X	NO
	80.0				X	NO
	84.0					
	85.0	Very dense yellow silty medium sand			X	NO
	90					

Date Drilled 8/8/84
Drilling Method Rotary
Drilled By POPE
Logged By M. Jewett
Checked By S.L.W.

Standard Penetration Test
Undisturbed Sample
Water Table (24 Hour)
Water Table (Time of Boring)
Laboratory Test Location

SO Strong contaminant odor
WO Weak to moderate contaminant odor
NO No contaminant odor

JAMES L. GRANT & ASSOCIATES
geotechnical engineering • management • computer science
ENGLEWOOD, COLORADO

Boring Number WC-8A
Job Number 804024

BORING RECORD

Elev. (Feet)	Depth (Feet)	Description	Unified Soil Classif.	Penetration Resistance, "N" Blows per Foot (10 20 30 40 50 60 70 80 90)	Sample Data	Remarks
	90.0	(See 84.0' to 90.0')				
	95.0				NO	
	100.0		SM		NO	
	105.0	Same				
	108.6					
	110.0	PASCAGOULA FORMATION: Very hard yellow and grey silty clay	CH		NO	
	110.5	Boring terminated @ 110.5'				
	115.0					

Date Drilled 8/8/84
Drilling Method Rotary
Drilled By POPE
Logged By M. Jewett
Checked By S.L.W.

Standard Penetration Test
Undisturbed Sample
Water Table (24Hour)
Water Table (Time of Boring)
L Laboratory Test Location

SO Strong contaminant odor
WO Weak to moderate contaminant odor
NO No contaminant odor

JAMES L. GRANT & ASSOCIATES
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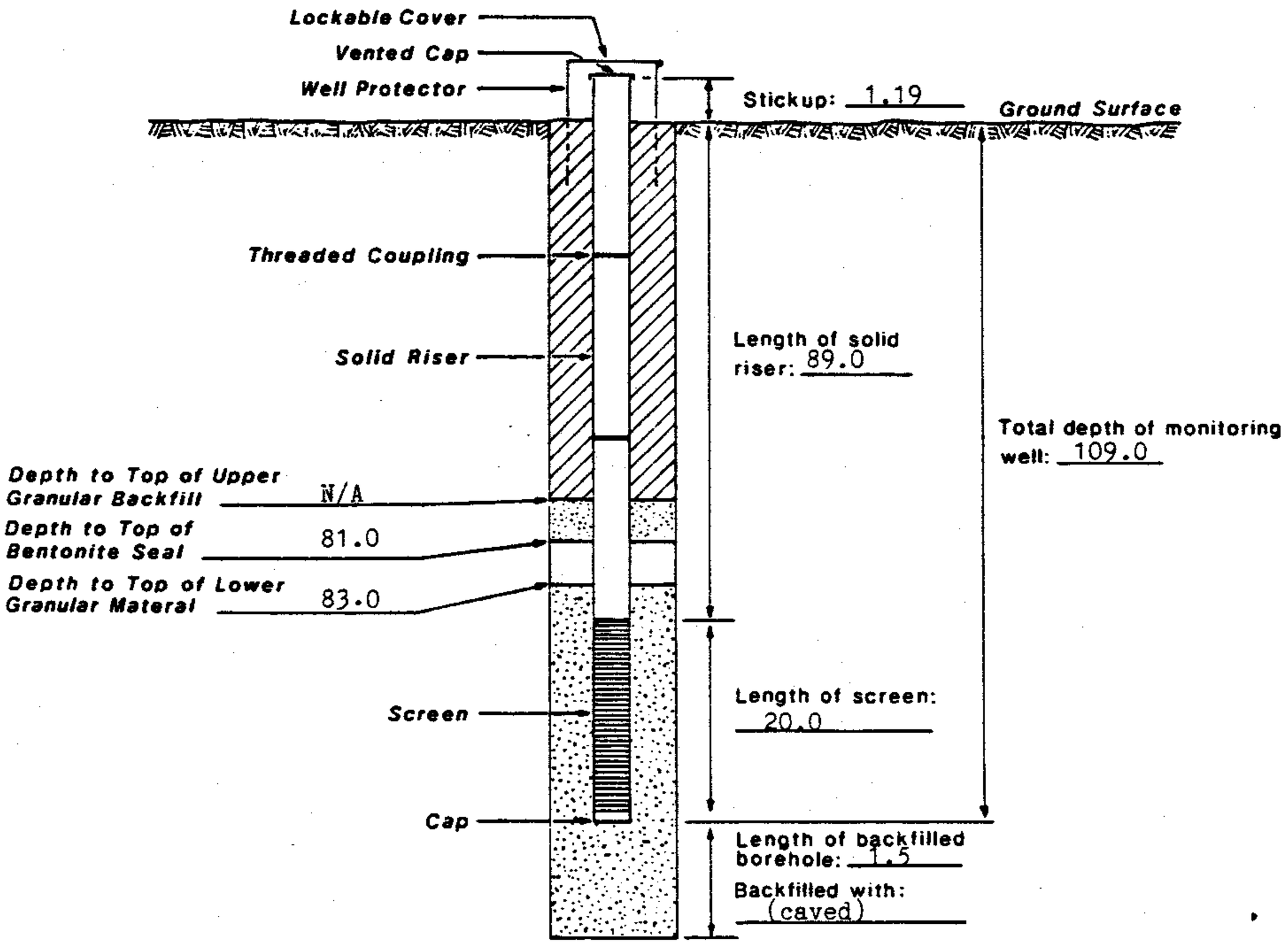
ENGLEWOOD, COLORADO

Boring Number WC-8A
Job Number 804024

MONITORING WELL INSTALLATION RECORD

Job Name IP WIGGINS TWP **Well Number** WC-8A
Job Number 804024 **Installation Date** 8/8/84 **Location** Wiggins, MS
Datum Elevation 224.43 **Ground Surface Elevation** 223.24
Datum for Water Level Measurement Black mark on top of PVC casing
Screen Diameter & Material 2" i.d. SCH 40 PVC **Slot Size** 0.005"
Riser Diameter & Material 2" i.d. SCH 40 PVC **Borehole Diameter** 6 3/4"
Granular Backfill Material Fine gravel **JLGA Representative** M. Jewett
Drilling Method Rotary wash **Drilling Contractor** POPE



▨ : Grout
□ : Bentonite
▩ : Granular Backfill

(Not to Scale)

Stabilized water level 31.92 feet below datum.
Measured on 8/31/84

JAMES L. GRANT & ASSOCIATES
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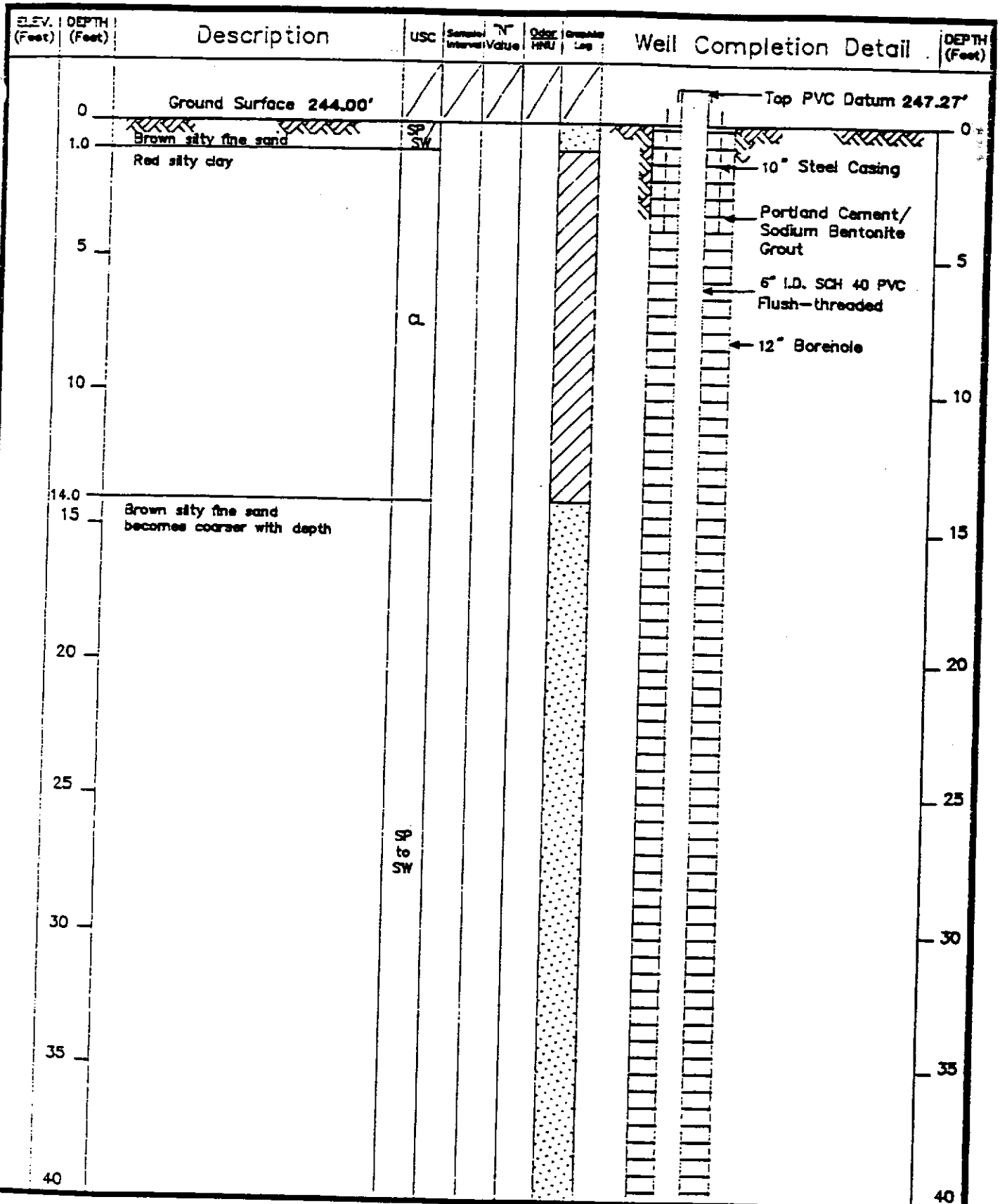
ENGLEWOOD, COLORADO

WELL WC-8A

MONITORING WELL INSTALLATION RECORD



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DENVER, COLORADO

Monitoring Well Record WCP-8

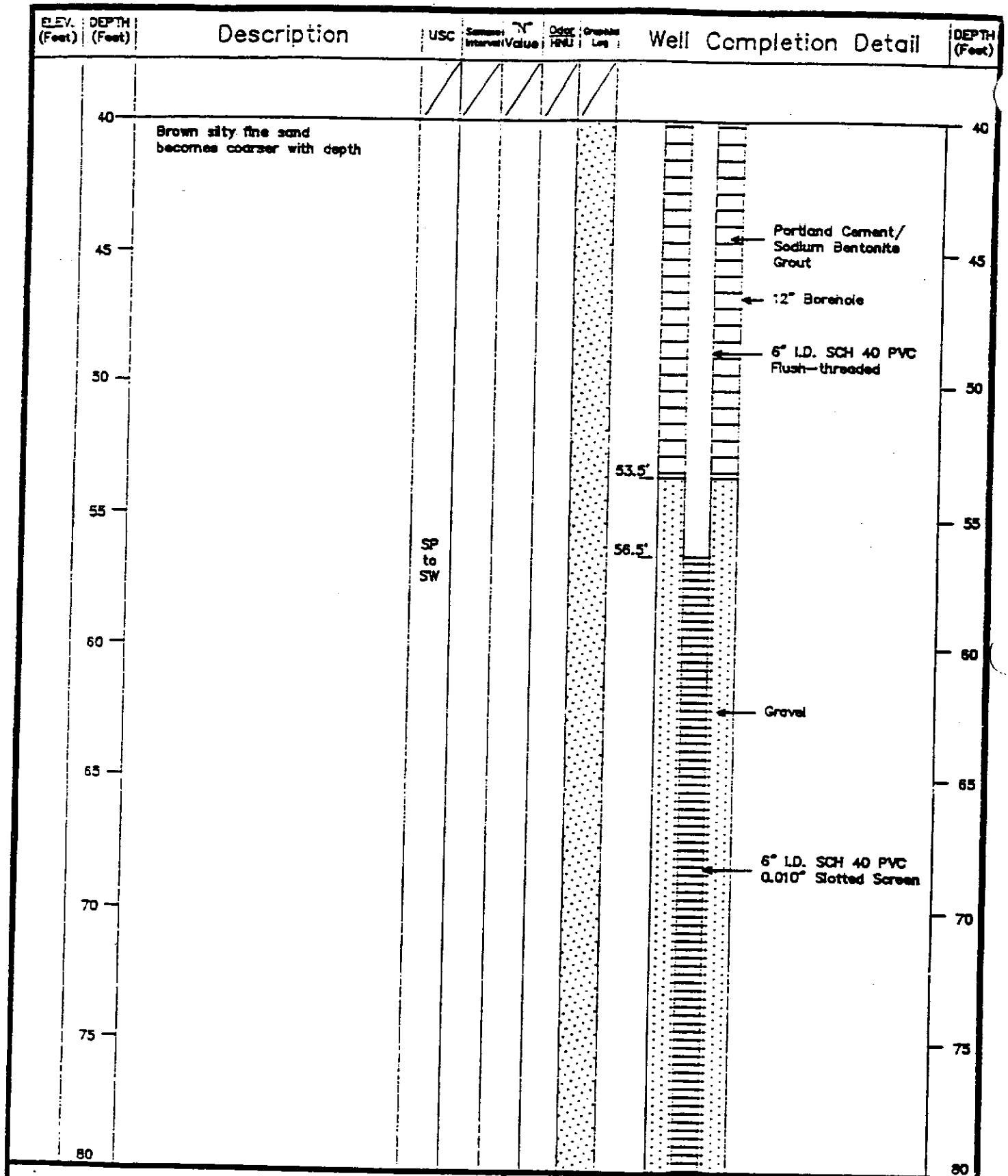
Location IP TWP FACILITY – WIGGINS, MS

Coordinates 9091.19 N 51487.83 E

Drilled By Cole's Clearwater Drilling Method Rotary wash

Logged By CMJ Checked By SLW

Installation Date November 8, 1988



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DENVER, COLORADO

Monitoring Well Record WCP-8

Location IP TWP FACILITY – WIGGINS, MS

Coordinates

Drilled By Cole's Clearwater Drilling Method Rotary wash

Logged By CMJ Checked By SLW

Installation Date November 8, 1988

TEST BORING RECORD

ELEV. (ft msl)	DEPTH FEET	DESCRIPTION	UNIFIED	PENETRATION RESISTANCE, "N" BLOWS PER FOOT (0 10 20 30 40 60 80)	SAMPLE TYPE OR CORE DATA	REMARKS
205.79	0	Topsoil: Grey silty fine SAND	SM			grab sample NO
	2.5	Citronelle Formation: firm to very firm reddish-brown or yellow silty fine to medium SAND.				
	5					NO
	10		SM			NO
	15					NO
	17.5					▽ 16.0'
	20	Loose to very firm tan slightly silty fine to medium SAND.				NO
	25		SP		L	NO
	30					NO
	32.5					
	35	Firm tan slightly clayey gravelly silty fine to medium SAND.	SM			NO
	37.5	Very loose to loose tan to white slightly silty fine to medium SAND with occassional silt or clay seams	SP			
	40					NO

DATE DRILLED 5/10-11/83
DRILLING METHOD rotary wash
DRILLED BY H. Carnley
LOGGED BY WWB
CHECKED BY SLW

STANDARD PENETRATION TEST
WATER TABLE 24 HR
WATER TABLE TIME OF BORING
UNDISTURBED SAMPLE
L LABORATORY TEST LOCATION

BORING NUMBER WT-1
JOB NUMBER 812073
PAGE 1 of -

SO STRONG CONTAMINANT ODOR
WO WEAK TO MODERATE CONTAMINANT ODOR
NO NO CONTAMINANT ODOR

TEST BORING RECORD

ELEV. (ft msl)	DEPTH FEET	DESCRIPTION	UNIFIED	PENETRATION RESISTANCE, "N" BLOWS PER FOOT (0 10 20 30 40 60 80)	SAMPLE TYPE OR CORE DATA	REMARKS
	40	Same as 37.5' to 40.0'				
	45	White, silty clay layer @ 44.9' to 45.3'	SP			NO
	47.5	Very loose to very dense white to tan silty fine to medium SAND with occassional thin red clayey silt layers and occassional gravel.				▽ 46.8'
	50				L	NO
	55		SM			NO
	60					NO
	65				L	NO
	67.5	Very dense tan slightly silty fine to medium SAND with occassional trace gravel and red clayey silt layers.				
	70		SP			NO
	75					NO
	80				SO/C	NO

DATE DRILLED 5/10-11/83
DRILLING METHOD rotary wash
DRILLED BY H. Carnley
LOGGED BY WWB
CHECKED BY SLW

⊠ STANDARD PENETRATION TEST
▽ WATER TABLE 24 HR
WATER TABLE TIME OF BORING
UNDISTURBED SAMPLE
L LABORATORY TEST LOCATION

BORING NUMBER WP-1
JOB NUMBER 612073
PAGE 2 of 4

SO STRONG CONTAMINANT ODOR
WO WEAK TO MODERATE CONTAMINANT ODOR
NO NO CONTAMINANT ODOR

TEST BORING RECORD

ELEV. (ft msl)	DEPTH FEET	DESCRIPTION	UNIFIED	PENETRATION RESISTANCE, "N" BLOWS PER FOOT (0 10 20 30 40 60 80)	SAMPLE TYPE OR CORE DATA	REMARKS
	80	Same as 67.5' to 80.0'	SP			
	82.5					
	85	Very dense tan silty fine to medium SAND.	SM	50/6"		NO
	87.5					
	90	Very dense tan slightly silty fine to medium sand	SP		L	NO
	94.0					
	95	Pascaqoula Formation (?): very stiff to very hard gray slightly sandy clayey SILT, some iron mottling. Well rounded quartz and chert gravel @ 95.5' to 96.2'				no recovery, but traces of clayey silt on spoon.
						NO
				50/6"		
					L	
	100	Reddish-brown clayey sandy silt layer @ 99.0'.	CL			NO
	105					NO
	107.5					
	110	Hard tan to gray fine sandy clayey SILT, some iron mottling.	ML			NO
	115					NO
	117.5	Very firm to dense light gray to reddish-brown clayey silty fine SAND; occassional reddish-brown sandy silt laminations	SM			
	120					NO

DATE DRILLED 5/10-11/83
DRILLING METHOD rotary wash
DRILLED BY H. Carnley
LOGGED BY WWE
CHECKED BY SLW

STANDARD PENETRATION TEST
WATER TABLE 24 HR
WATER TABLE TIME OF BORING
UNDISTURBED SAMPLE
L LABORATORY TEST LOCATION

SO STRONG CONTAMINANT ODOR
WO WEAK TO MODERATE CONTAMINANT ODOR
NO NO CONTAMINANT ODOR

BORING NUMBER WP-1
JOB NUMBER 812073
PAGE 3 of

TEST BORING RECORD

ELEV. (ft msl)	DEPTH FEET	DESCRIPTION	UNIFIED	PENETRATION RESISTANCE, "N" BLOWS PER FOOT (0 10 20 30 40 60 80)	SAMPLE TYPE OR CORE DATA	REMARKS
	120	Same as 117.5' to 120.0'				
	125					NO
	130		SM			NO
	135	Reddish-brown silty fine to medium sand layer @ 134.0'.				NO
	140				L	NO
	142.5	Very firm light gray clayey silty fine to medium SAND.				
0.29	145					NO
	145.5	Boring Terminated @ 145.5'				

DATE DRILLED 5/10-11/83
DRILLING METHOD rotary wash
DRILLED BY H. Carnley
LOGGED BY WWB
CHECKED BY SLW

STANDARD PENETRATION TEST
WATER TABLE 24 HR
WATER TABLE TIME OF BORING
UNDISTURBED SAMPLE
L LABORATORY TEST LOCATION

BORING NUMBER WF-1
JOB NUMBER 812073
PAGE 4 OF 4

SO STRONG CONTAMINANT ODOR
WO WEAK TO MODERATE CONTAMINANT ODOR
NO NO CONTAMINANT ODOR

TYPE II MONITORING WELL INSTALLATION RECORD

JOB NAME IP-Wiggins WELL NUMBER WP-1

JOB NUMBER 812073 INSTALLATION DATE 5/10-13/83 LOCATION refer to location map

DATUM ELEVATION 207.56' msl GROUND SURFACE ELEVATION 205.79' msl

DATUM FOR WATER LEVEL MEASUREMENT top PVC casing

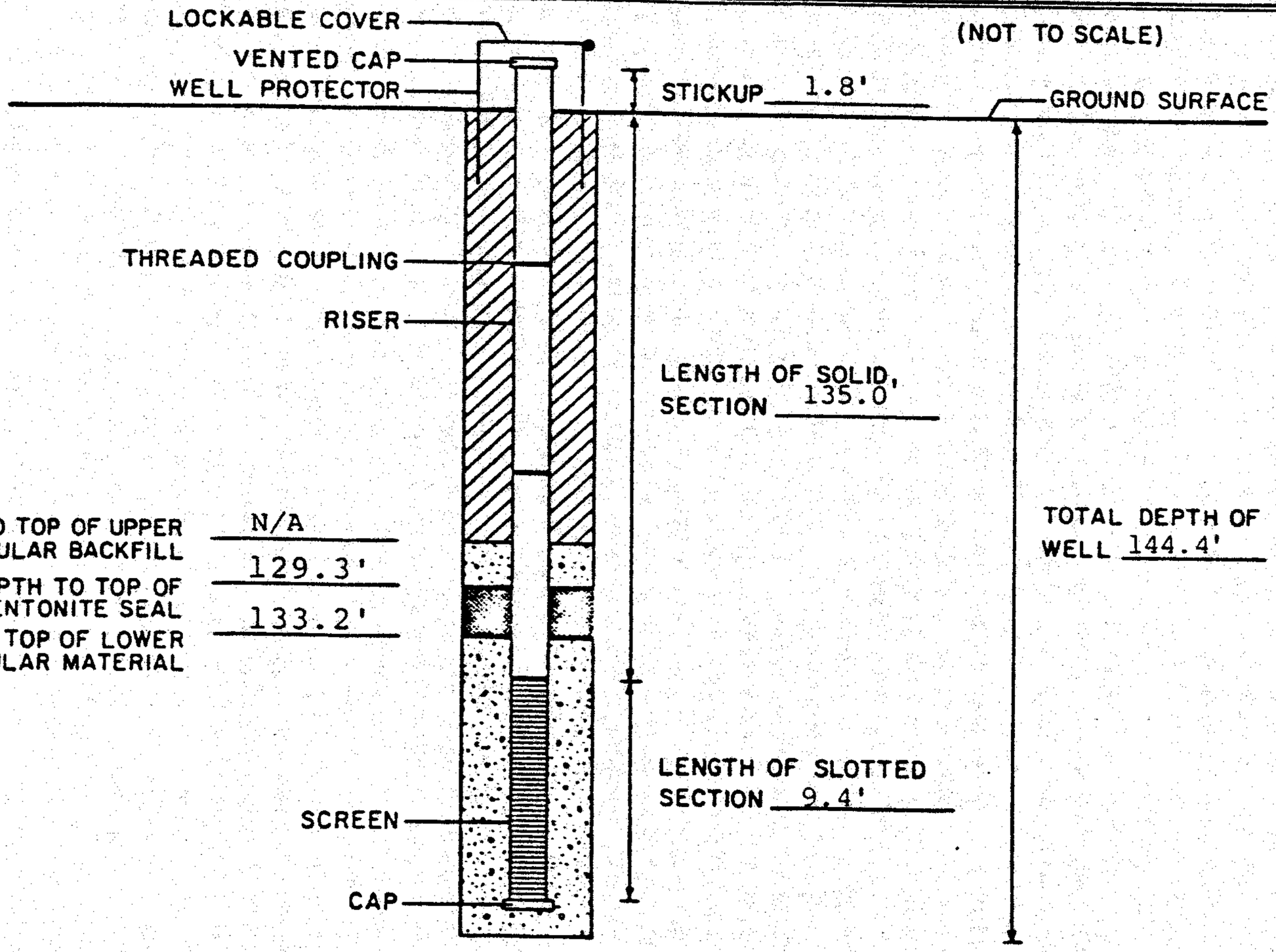
SCREEN DIAMETER AND MATERIAL 2" i.d. schedule 40 PVC SLOT SIZE .010"

RISER DIAMETER AND MATERIAL 2" i.d. schedule 40 PVC BOREHOLE DIAMETER 8"

GRANULAR BACKFILL MATERIAL Gravelly silty fine-coarse sand LAW ENGINEERING FIELD REPRESENTATIVE W. Bath

DRILLING TECHNIQUE rotary wash DRILLING CONTRACTOR Law-Birmingham

(NOT TO SCALE)



GROUT

BENTONITE

GRANULAR BACKFILL

STABILIZED WATER LEVEL 10.9 FEET BELOW GROUND SURFACE

MEASURED ON 5/24/83

LAW ENGINEERING TESTING COMPANY

DENVER, COLORADO

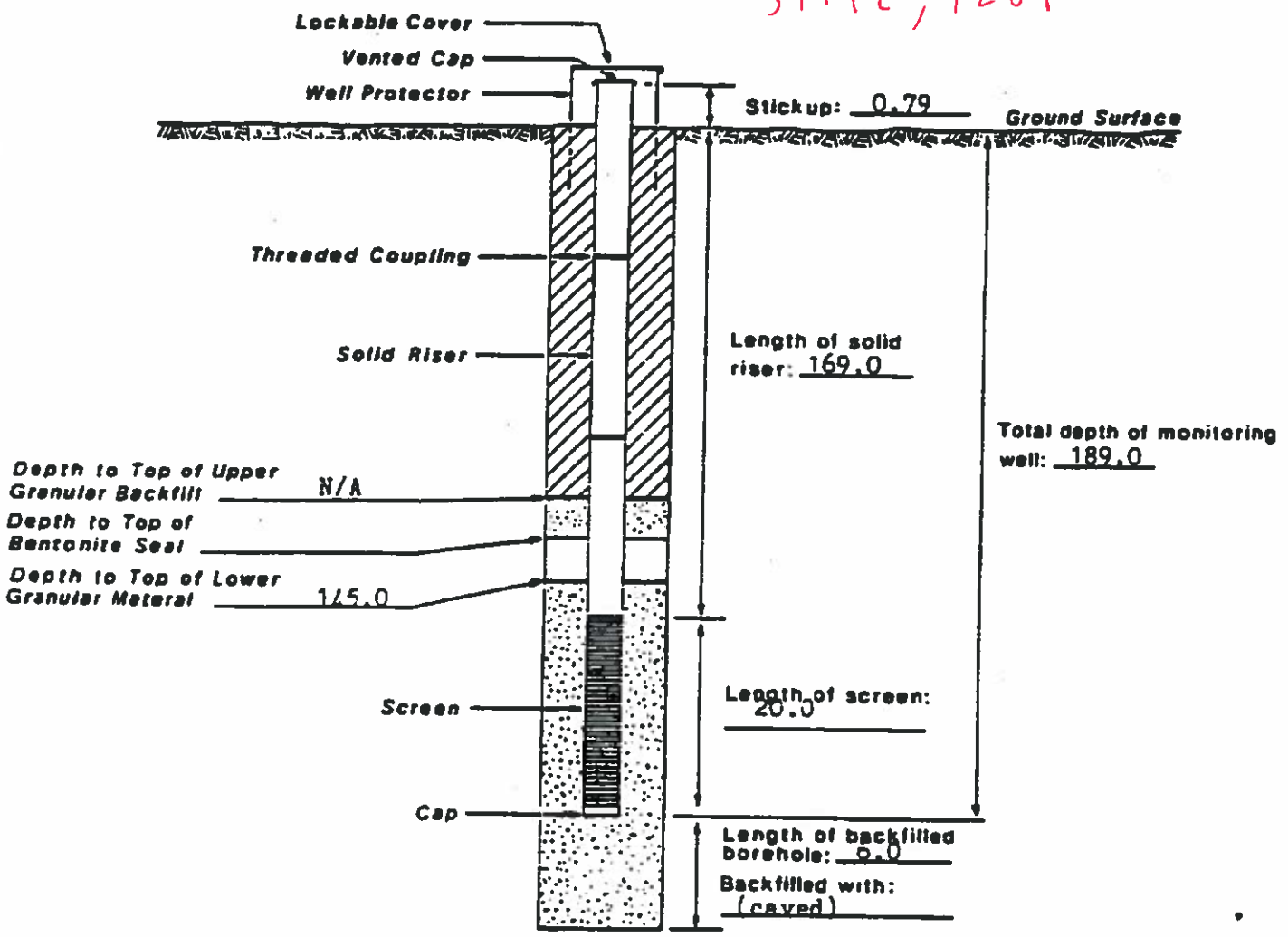
TYPE II MONITORING WELL WP-1

INSTALLATION RECORD

MONITORING WELL INSTALLATION RECORD

Job Name TP WIGGINS TWP — Well Number WP-2
Job Number 80/024 — Installation Date 8/15/84 — Location Wiggins, MS
Datum Elevation 239.39 — Ground Surface Elevation 238.60
Datum for Water Level Measurement Top of PVC casing
Screen Diameter & Material 2" i.d. SCH 40 PVC — Slot Size 0.005"
Riser Diameter & Material 2" i.d. SCH 40 PVC — Borehole Diameter 4 3/4"
Granular Backfill Material Fine gravel — JLGA Representative M. Jewett
Drilling Method Rotary wash — Drilling Contractor POPE

51492, 9289



(Not to Scale)

Stabilized water level 50.61 feet below datum.
Measured on 8/31/84

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WELL WP-2

MONITORING WELL INSTALLATION RECORD

BORING RECORD

Surface Elev. (Feet)	Depth (Feet)	Description	Unified Soil Classif.	Penetration Resistance, "N" Blows per Foot (10 20 30 40 50 60 70 80 90)	Sample Data	Remarks
238.60		No samples taken from 0 to 119.0'. See log of WC-2 for interval between 0 and 69.5.				
	119.0					
	120.0	CITRONELLE FORMATION: Very dense red and pink fine to medium silty sand	SM			NO
	123.0					
	125.0	Hard yellow and grey silty clay with trace of very fine sand	CH			NO
	130.0					
	132.5					
	135.0	Very stiff to hard blue-grey silty clay				NO
	140.0					
	145.0					NO
	150.0					
	155.0					NO

Date Drilled 8/15/84
Drilling Method Rotary
Drilled By POPE
Logged By M. Jewett
Checked By S.L.W.

- Standard Penetration Test
- Undisturbed Sample
- Water Table (24Hour)
- Water Table (Time of Boring)
- L Laboratory Test Location

- SO Strong contaminant odor
- WO Weak to moderate contaminant odor
- NO No contaminant odor

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Boring Number WP-2
Job Number 804024
Page 1 of 2

BORING RECORD

Elev. (Feet)	Depth (Feet)	Description	Unified Soil Classif.	Penetration Resistance, "N" Blows per Foot (10 20 30 40 50 60 70 80 90)	Sample Data	Remarks
	155.0	See 132.5 to 155.0				
	160.0		CH			
	165.0				NO	
	170.0					
	171.0					
	175.0	Very hard blue-grey fine sandy silt and thin organic streaks below 185.0'	ML		NO	
	180.0					
	185.0				NO	
	187.5					
	190.0					
		Very hard blue-grey silty clay				
	195.0	Boring terminated @ 195.0'			NO	

Date Drilled 8/15/84
Drilling Method Rotary
Drilled By POPE
Logged By M. Jewett
Checked By S.L.W.

- Standard Penetration Test
- Undisturbed Sample
- Water Table (24 Hour)
- Water Table (Time of Boring)
- L Laboratory Test Location

SO Strong contaminant odor
WO Weak to moderate contaminant odor
NO No contaminant odor

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Boring Number WP-3
Job Number 804022
Page 2 of 2

APPENDIX B
PHOTOGRAPHS

Photograph of one of three monitoring wells observed inside the closed units on December 10, 2019.

APPENDIX C
FIELDWORK DOCUMENTATION FORMS

EARTHCON
Environmental Challenges
BUSINESS SOLUTIONS

International Paper **Groundwater Sampling Record**

WELL No.	PROJECT #	LOCATION	DATE
SAMPLE No.	PROJECT NAME	FIELD PERSONNEL/COMPANY	
SAMPLE TIME:	SITE	FIELD CONDITIONS/WEATHER	

Well Condition Inspection (circle one)

cover: locked not locked
number: legible not legible
outer casing: good fair poor
inner casing: good fair poor
well photographed: yes no

Equipment Cleaning Procedures

- potable water and phosphate-free soap
- potable water rinse
- water rinse: distilled deionized
- solvent rinse: acetone hexane
- air dry

Casing Diameter:
(circle one)
2" 4"
6" Other:____

Casing Volume Calculation: $(\pi r^2 h)(7.48\ gal/ft^3)$
Casing Volume (gallons/ft) for: 2" = 0.163; 4" = 0.653; 6" = 1.47

Depth to Water (feet): _____
Depth of Well (feet): _____
Water Column (feet): _____
Casing Volume (gallons): _____
Calculated Purge Volume (gallons): _____
Actual Purge Volume (gallons): _____

Measuring Point Elevation (feet): _____
Groundwater Surface Elevation: _____
LNAPL present: _____ thickness: _____
DNAPL present: _____ thickness: _____
Remarks: _____

Well Evacuation
Water level recovery is: very slow slow moderate fast Bailed dry: yes no

TIME 2400 hrs	CUMULATIVE VOLUME (gal)	TEMP (^oC)	pH	CONDUCTIVITY ($\mu s/cm$, 25^oC)	DISSOLVED OXYGEN (mg/L)	Eh (mV)	TURBIDITY (NTU)	ODOR/COLOR/ REMARKS
	0							PURGE START

Measurement and Sampling Equipment

Type	Manufacturer	Model #	Calibration Date
pH/ORP/Cond/DO/Temp			
Turbidity			
SS Bladder Pump			

SAMPLE NUMBER	ANALYTICAL METHOD	BOTTLE TYPE/ PRESERVATIVES	QA REMARKS